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# Mall Parking System using Python

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**ABSTRACT:** The proposed system in this paper is an advanced solution for monitoring the parking slots available in parking sections of malls for the incoming vehicle to be parked and allotting it to a nearest parking slot, which is done without any human interventions or human interference. The technology which is used is Image processing which helps our motive of allocation and deallocations of the parking slot for a vehicle by scanning of its number plate at the entrance and exit. The system also features LED strips which lights the path of the allocated parking space to the driver of the vehicle. Displays configured and placed at the entry will show the number of vacant parking slots available and display at the exit will show the parking toll. Image processing is a technology or Computer algorithm which performs image processing on digital images, which is possible by python language. This project shall meet all its objectives and purpose of its implementation.

**KEYWORDS:-** Mall Parking System (MPS), Scanning of its number plate, SQLite

## I.INTRODUCTION

### A. Overview:

It is common to have huge crowds in shopping malls during peak hour (lunch time, dinner time and weekend) and discounted sale festive season. Discounts offered by shopkeepers in shopping mall can attract a lot of customers to come. Most of the customers travel to the shopping mall with their own vehicles and this indirectly cause the problem of finding empty car parking space for the car drivers. Parking space is necessary for shopping complexes. They provide a comfortable and quality parking for the customers. Nowadays, parking area needs to be constructed in a multi-level manner, since the amount of vehicles is increasing rapidly. As a consequence, drivers face difficulties in searching empty space for parking in a multi-level parking area. Because of such situation, mall owners employ security personals on every level to guide the drivers. But this cant be a final solution to our problem. Therefore, the proposed system in this paper not only relieves the drivers from seeking parking space but also reduces number of security guards from the parking area and makes the parking process simple.

### B. Proposed system functions:

- The main aim is to reduce human efforts of personnel's which are involved in parking systems in malls, office buildings, stadiums etc.
- Example: In malls in the parking section there are at least three to four security personals which are involved in showing the way for a car to be parked, one at entry and one at the exit.
- Also currently in mall parking there is a paper slip which is given to the car driver at the entry this slip has to be preserved and reproduced at the exit. Depending on the time the car was parked in the mall a parking toll is charged.
- This process is complex and can lead to paying higher amounts if the slip is lost.

### C.ADVANTAGE OF SYSTEM

EASY IMPLEMENTATION AND MANAGEMENT.

BETTER PARKING EXPERIENCE.

REDUCED TRAFFIC AND POLLUTION.

INCREASED SAFETY AND SECURITY.



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## II.SYSTEM ANALYSIS

### A.PROBLEM DEFINITION:

To reduce the number of security guards in parking systems in malls, buildings, estates, etc. and make the parking process simpler by guiding the vehicle electronically through LED strips.

### B.IMPLEMENTATION :

#### Software requirement:

In this web development project were using Python for frontend And for the Backend SQLite.

#### Hardware requirement:

Servo motor  
Arduino uno  
IR sensor  
Web cam

#### 1.Servo motor



Figure: 2.1

The servomotor consists of 3 wires. Two of these wires provide ground and positive supply and the third one is for control signal to the DC servomotor. The servomotor is moved to a desired angular position by sending PWM (pulse width modulated) signals on control wire. Servomotor is based on the principle of pulse position modulation. A pulse width changing from 1ms to 2ms in continuous frame time is sent to servo for about 50 times in a second. The pulse width is determined by the angular position.

#### 2. Arduino Uno Board

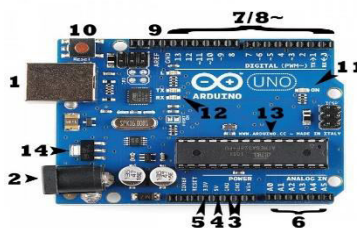


Figure: 2.2

Arduino is an open-source platform for making electronics projects. It has a physical programmable circuit board and a piece of software called IDE (Integrated Development Environment) which is used to write and upload the code to the Arduino board. A USB cable is required to connect the board to a system for the purpose of uploading the code.



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### 3. IR Sensor

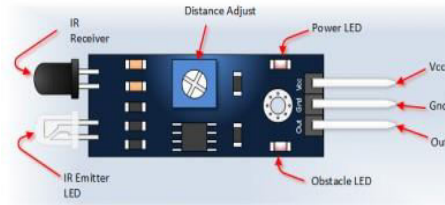


Figure: 2.3

Infrared Obstacle Sensor Module has built-in IR transmitter and IR receiver that sends out IR energy and looks for reflected IR energy for the detection of presence of any obstacle in front of the sensor module. There is a potentiometer on the module to adjust the range. Operating Voltage is from 3.0V- 5.0V, the detection range is 2cm-30cm (Adjustable using potentiometer). The Current Consumption: at 3.3V is 23 mA, and at 5.0V is 43 mA.

### 4. USB Camera



Figure: 2.1

#### Web Camera Specifications

- Built in mic with noise reduction
- Interpolated to 25 Mega Pixels
- 10 Level Zoom: on live Motion Picture
- Special Visual Effects
- True Motion Picture
- Night Vision: 6 Bright light
- Inbuilt Sensitive Microphone
- Background Changeable: of Live Motion Picture
- UP TO 30% Better Exposure: To Give better Picture Even in dark
- Resolution Hardware : 500K pixels
- Image Quality: RGB24 or I420
- Exposure : Auto or manual, Angle of View 58 degree
- Interface : USB2.0
- Frame Rate: 30 fps (MAX)
- Lens f=6.0 F=2.0
- Focus Range 4cm to infinity
- Colour Option: Black
- Supports: Windows Vista, Windows 7 (32-bit or 64-bit) or Windows 8
- Basic requirements: 1 Ghz, 512 MB RAM or more, 200 MB hard drive space, Internet connection USB 1.1 port (2.0 recommended)
- DIMENSIONS: 5.8 x 7.8 x 5.5 cm (Camera)



FLOWCHART :

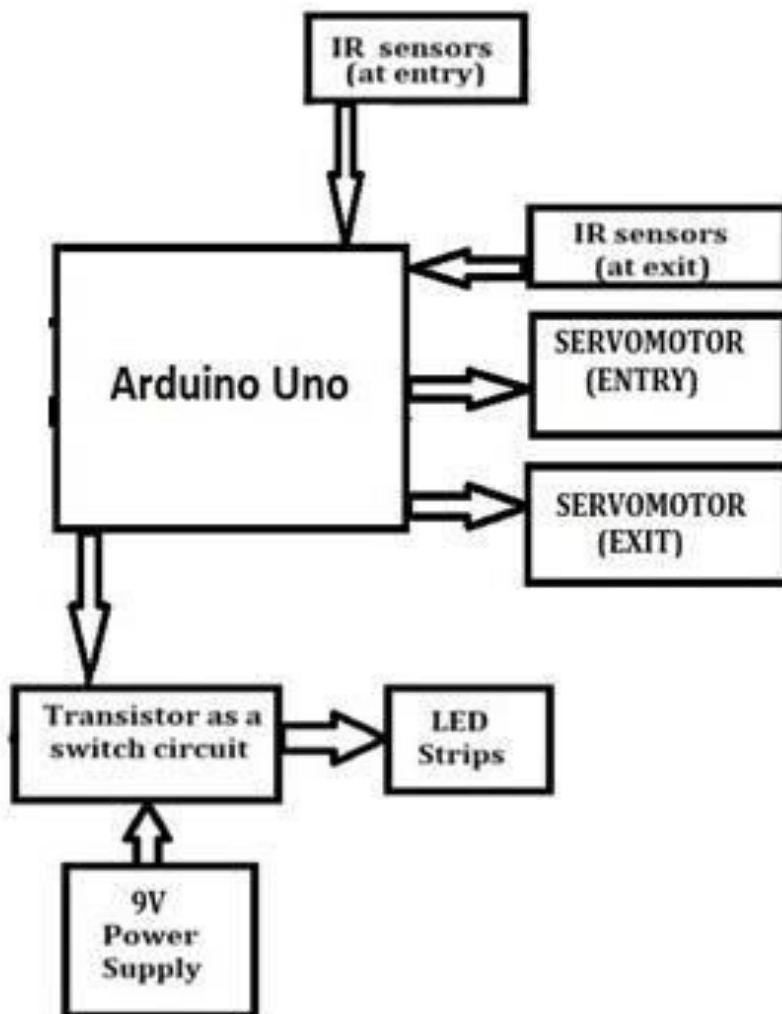


Figure: 2.5

**Pins Connection between Arduino, IR sensors and servomotors**

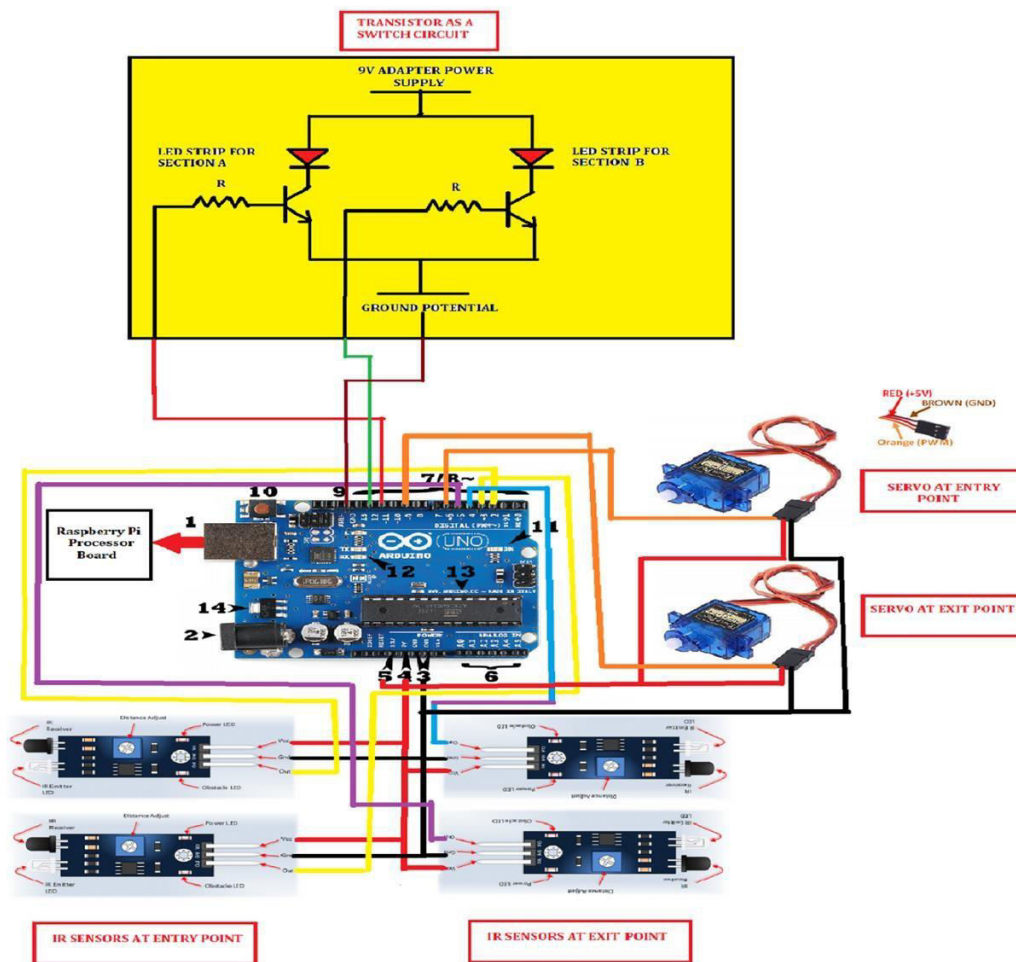


Figure: 2.6

**III.CONCLUSIONS**

**A.CONCLUSION:**

The automatic number plate recognition system plays an important role in detecting number plates. The system use series of image processing techniques for identifying the characters stored in the database. The system is implemented in python along with openCV and its performance is tested on real images. The system robustness and speed can be increase if high resolution camera is used.



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